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Country Market Survey

# Telecommunications Equipment

ORIGINAL

# Canada

U.S. DEPARTMENT OF COMMERCE
International Trade Administration

Canada

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The Canadian telecommunications equipment market is expected to grow at a healthy pace during the 1984-89 period to a total of $2.6 billion in 1989 (see table 1 and figure 1). Technological factors and the current political climate are fostering structural shifts in the industry and opening new doors to competition. Deregulation is the principal issue before policymakers, but movement in this direction has been slower than in the United States because the unique mixture of Federal, provincial, and local regulatory regimes in Canada has precluded development of a unified national policy. In 1980, a Federal decision to permit customer purchase of telephone equipment gave birth to the interconnect industry in about 60 percent of the domestic market; the remainder under provincial oversight retained its monopoly status. This opening to competition produced rapid growth in the new industry, which had sales of about $227 million in 1983.

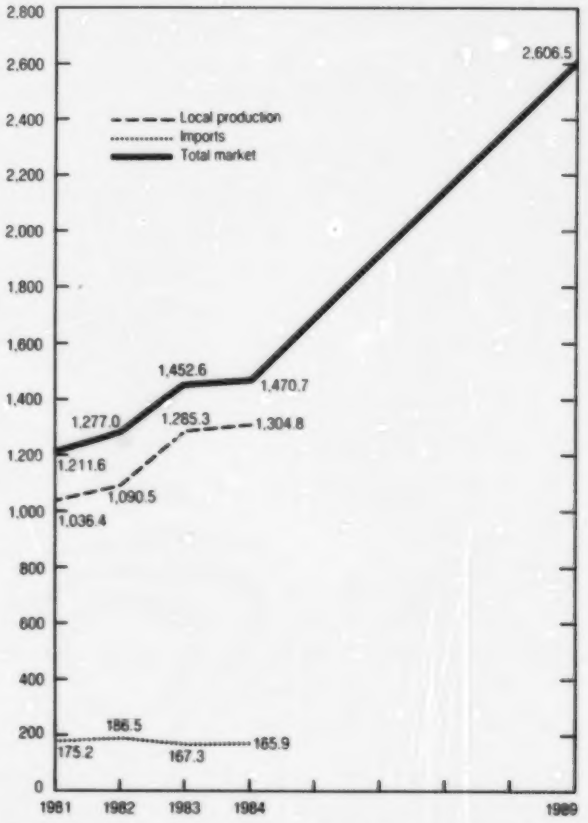
The Federal Government is currently deliberating the introduction of competition to a variety of telecommunications services, including the long-distance telephone market, and it is considering a single national regulatory approach. Progress in these directions should stimulate nationwide services development, increased equipment investments by business, and new opportunities for vendors.

## Product Markets

Sturdy growth in the market for **telephone and related equipment** rises from the continuing move to digital switching systems and from deregulation in the area of user premises equipment (see table 2). Switching equipment accounts for about one-fifth of all communications equipment expenditures; it is estimated that 70 percent of 1984 investments went for digital switches, which are now accessible to small as well as medium- and large-scale enterprises. The latest technology is being introduced throughout this category, including Mitel's SX-2000 PBX system, which handles up to 3,500 lines and carries data as well as voice (current speed of 19.2 Kbit/s to be increased to 56.2 Kbit/s).

**Transmission equipment** is expected to be the second-fastest growing market segment between 1984 and 1989, with projected 1989 sales of $1.1 billion. The move from analog to digital technology in microwave systems and multiplexers provides the major impetus for growth; both Telecom Canada and CNCP are implementing digital microwave projects. The advantages of fiber optic technology have led to extraordinary growth rates, yet projections underestimate demand, as Bell Canada has announced further plans for fiber optic installations. Necessary upgrading of the 90,000-kilometer cable television network is likely to cost about $1.5 billion. Foreign subsidiaries and suppliers of transmission equipment tend to serve the cable industry more than they do telecommunications carriers.

**Figure 1**
**Canada: The market for telecommunications equipment, 1981-89**
**(in millions of U.S. dollars)**




The **mobile radio** market will experience radical change in size and structure as national plans for the cellular telephone business are implemented. Initial service is to be offered in 23 metropolitan areas by two providers, a telephone company and a nonwireline company, competing in each area. Cantel Cellular Radio Group has been selected as the sole nonwireline provider in all 23 cities. Cantel has a primary supplier, Novatel, and sales prospects with the telephone companies will be limited to subcontracting with primary suppliers. Expenditures for 1989 for cellular terminals, controlling systems, and service contracts are estimated at $463 million.

**Radio and television broadcast equipment** market imported 60 percent of its purchases in 1984. New digital technology being developed and introduced in audio and video equipment may change the industry's structure. Canadian TV uses NTSC color encoding

Note: All values are given in U.S. dollars. Local currency is converted at the following exchange rates: US$1 = C$1.20 (1981); C$1.23 (1982 and 1983); and C$1.30 (1984 and subsequent years). Values for 1984 and later years are given in 1984 constant dollars.

**Source: "Report on the Canadian Telecommunications Industry," Currie, Coopers, & Lybrand, 135 King Street East, Toronto, Ontario, M5C 1G6, January 1985, prepared under contract to the International Trade Administration, Office of Trade Information Services (see Additional Information box), and desk research.**

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*Table 1.—Canada: The market for telecommunications equipment, 1981-84 and 1989*[1]

(in millions of Canadian dollars and of U.S. dollars)

| | 1981 | | 1982 | | 1983 | | 1984 | | Projected 1989 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | C$ | US$ | C$ | US$ | C$ | US$ | C$ | US$ | C$ | US$ |
| Telephone and telex/telegraph equipment | | | | | | | | | | |
| Production | 605.1 | 504.7 | 669.5 | 542.5 | 802.1 | 650.8 | 823.6 | 635.9 | | |
| Imports | 25.9 | 21.6 | 22.8 | 18.5 | 26.3 | 21.3 | 24.4 | 18.8 | | |
| Total | 631.0 | 526.3 | 692.3 | 561.0 | 828.4 | 672.1 | 848.0 | 654.7 | 1,416.0 | 1,093.3 |
| Transmission equipment | | | | | | | | | | |
| Production | 513.7 | 428.4 | 542.8 | 439.8 | 635.9 | 516.0 | 709.4 | 545.1 | | |
| Imports | 72.7 | 60.6 | 99.7 | 80.8 | 61.7 | 50.1 | 55.7 | 42.8 | | |
| Total | 586.4 | 489.0 | 642.5 | 520.6 | 697.6 | 566.1 | 765.1 | 587.9 | 1,398.2 | 1,079.6 |
| Mobile radio equipment[2] | | | | | | | | | | |
| Production | 17.0 | 14.2 | 22.4 | 18.2 | 24.8 | 20.1 | 25.9 | 20.0 | | |
| Imports | 4.5 | 3.8 | 1.1 | .9 | 1.2 | 1.0 | 1.1 | .8 | | |
| Total | 21.5 | 18.0 | 23.5 | 19.1 | 26.0 | 21.1 | 27.0 | 20.8 | 39.5 | 30.5 |
| Data communications equipment | | | | | | | | | | |
| Production | 46.4 | 38.7 | 43.4 | 35.2 | 44.8 | 36.4 | 46.5 | 35.9 | | |
| Imports | 2.4 | 2.0 | 2.3 | 1.9 | 2.4 | 1.9 | 2.5 | 1.9 | | |
| Total | 48.8 | 40.7 | 45.7 | 37.1 | 47.2 | 38.3 | 49.0 | 37.8 | 80.7 | 62.3 |
| Radio and television broadcast equipment[3] | | | | | | | | | | |
| Production | 60.4 | 50.4 | 67.6 | 54.8 | 76.4 | 62.0 | 87.9 | 67.9 | | |
| Imports | 104.6 | 87.2 | 104.9 | 85.0 | 114.5 | 93.0 | 131.6 | 101.6 | | |
| Total | 165.0 | 137.6 | 172.5 | 139.8 | 190.9 | 155.0 | 219.5 | 169.5 | 441.4 | 340.8 |
| Total expenditures | | | | | | | | | | |
| Production | 1,242.6 | 1,036.4 | 1,345.7 | 1,090.5 | 1,584.0 | 1,285.3 | 1,693.3 | 1,304.8 | | |
| Imports | 210.1 | 175.2 | 230.8 | 186.5 | 206.1 | 167.3 | 215.3 | 165.9 | | |
| Total | 1,452.7 | 1,211.6 | 1,576.5 | 1,277.0 | 1,790.1 | 1,452.6 | 1,908.6 | 1,470.7 | 3,375.8 | 2,606.5 |

[1] Because these data are based on expenditures on communications equipment, export data are not necessary to reflect market size.

[2] Not including cellular radio.

[3] Including CATV equipment.

Source: "Report on the Canadian Telecommunications Industry," prepared under contract to the International Trade Administration, Office of Trade Information Services (see Additional Information box).

and serves a busy market that in 1983 averaged one TV set per two Canadians. Official authorization of new cable television services is expected to stimulate increased investment in equipment needed for interactive and transactional services.

Decentralization and the desire for increased efficiency in internal communications on the part of Canadian businesses sustain growth in the **data communications** market. Multiplexers and concentrators to reduce line costs and computer switching equipment to provide for more versatile access and reduce port congestion are the strongest product categories. A recent product entry, Gandalf's PACX 2000 data switch, allows information distribution throughout offices and factories as well as computer centers. Other developing product areas are electronic mail, store and forward messaging, and sophisticated data retrieval systems.

The market for electronic instrumentation and measuring equipment, including telecommunications **testing equipment,** experienced strong annual growth between 1977 and 1982 but has slowed considerably since then. The 1983 market for all test equipment totaled $1.2 billion, with imports providing about 42 percent.

Design and other **support services** in the Canadian market are provided by a range of specialized firms and general accounting and management consulting organizations. Domestic firms offer expertise in the fields of traditional telephony, space communications, cable television, broadcasting, data processing, and other facets of civilian and military communications, and several have had major international contracts.

The 1984 market of $31 million in **satellite earth equipment** expenditures was down substantially from the peak year of 1982 when Telesat Canada, the nation's sole domestic satellite operator, completed launches of its Anik C and D satellites. Telesat is now concentrating on developing sophisticated terminal equipment and introducing new services. The market for privately owned satellite television receive-only terminals is expanding. The Government has abolished licensing requirements for individual purchase of satellite dishes. Telesat and its consortium partners in Telecom Canada recently introduced the Stratoroute 2000 service integrating voice, data, and image transmission to allow business and government users to establish shared and private networks. The new service uses time-division multiple access and dual spot-beam technology and eventually will provide for



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full-motion video conferencing and digital access at 1.544 Mbit/s.

The Government has played a principal role in satellite communications development, building the early satellites in government laboratories and pursuing policies designed to strengthen industry and ensure Canadian content in all aspects of network development. The domestic equipment industry has the technical capability to provide almost all products required. The Federal Department of Communication (DOC), after determining the feasibility of a mobile satellite system, has signed an agreement with NASA for a joint Canadian-U.S. program to define a system to meet the needs of both countries. If the joint arrangement is not pursued, DOC and Telesat will consider a domestic system.

*Table 2.—Canada: Sales of telecommunications equipment by subcategories, 1981-84 and 1989*
(in millions of U.S. dollars)

| | 1981 | 1982 | 1983 | 1984 | Projected 1989 |
|---|---|---|---|---|---|
| Telephone and related equipment | | | | | |
| Switches and switching systems | 276.1 | 320.0 | 387.7 | 371.2 | 664.0 |
| Subscriber/user premises | 223.5 | 215.1 | 263.4 | 262.0 | 393.8 |
| Other telephone and central office equipment | 26.7 | 25.9 | 21.1 | 21.6 | 35.5 |
| Total market | 526.3 | 561.0 | 672.2 | 654.8 | 1,093.3 |
| Transmission equipment | | | | | |
| Cable | | | | | |
| Copper | 234.3 | 216.6 | 217.5 | 245.5 | 302.4 |
| Underground | 44.2 | 40.5 | 42.8 | 48.6 | 64.8 |
| Multiplexers | | | | | |
| Analog | 40.2 | 44.4 | 48.8 | 39.8 | 44.3 |
| Digital | 91.5 | 117.3 | 124.5 | 128.9 | 259.2 |
| Microwave | | | | | |
| Analog | 23.5 | 26.5 | 23.9 | 19.3 | 28.8 |
| Digital | 31.9 | 43.3 | 73.4 | 68.0 | 239.3 |
| Fiber optics | 5.6 | 11.1 | 14.8 | 19.3 | 112.0 |
| Pole wire | 19.2 | 18.0 | 20.4 | 21.3 | 28.8 |
| Total market | 490.4 | 517.7 | 566.1 | 590.7 | 1,079.6 |
| Mobile radio equipment | | | | | |
| Radio telephone | 5.4 | — | — | 5.4 | — |
| Mobile telephone | 12.5 | — | — | 15.4 | — |
| Total market | 17.9 | 19.1 | 21.1 | 20.8 | 30.5 |
| Radio and television broadcast equipment | | | | | |
| Broadcast equipment | 60.1 | 67.2 | 77.4 | 84.7 | 170.3 |
| CATV equipment | 77.6 | 72.6 | 77.6 | 84.8 | 170.5 |
| Total market | 137.7 | 139.8 | 155.0 | 169.5 | 340.8 |
| Data communications equipment | | | | | |
| Multiplexers/ concentrators | 8.2 | 9.5 | 9.8 | 9.7 | 16.0 |
| Computer switching | 6.4 | 8.1 | 9.3 | 9.2 | 15.2 |
| Modems | 19.4 | 11.0 | 8.4 | 8.3 | 13.6 |
| Front ends | 3.8 | 2.9 | 4.1 | 4.0 | 6.6 |
| Limited distance data set | .6 | .9 | .6 | .6 | 1.0 |
| Other | 2.3 | 4.9 | 6.2 | 6.1 | 10.0 |
| Total market | 40.7 | 37.3 | 38.4 | 37.9 | 62.4 |

Sources: Canadian Department of Communications; International Trade Administration research report.

## Competitive Assessment

The Canadian telecommunications equipment industry supplies 89 percent of domestic purchases and is an aggressive and effective exporter, particularly in the American market. Its strength and dominance derive from a combination of technological innovation, vertical integration of the industry, high levels of expenditure on research and development, and "buy Canadian" attitudes on the part of local purchasers.

The industry is led by Northern Telecom Ltd. (Nortel), which provides over two-thirds of telecommunications equipment in Canada and is the second largest designer/producer in North America. In 1983, Nortel had revenues of $2.7 billion, 45,000 employees, and 46 manufacturing plants around the world. A pioneer in digital transmission and switching equipment, the company offers an impressive range of products and is positioning itself to compete effectively in integrated data communication systems.

Other major manufacturers include Microtel, Mitel, Electrohome Ltd., Canadian Marconi Ltd., Spar Aerospace Inc., and Gandalf Technologies Inc. (see list of Leading Suppliers). Mitel, manufacturer of advanced switching systems for small and medium-sized businesses, achieved spectacular annual average growth of over 100 percent between 1975 and 1983. In 1982, these six firms accounted for 23 percent of total sales by local manufacturers and employed 35 percent of workers.

A large number of small and medium-sized firms (including foreign subsidiaries) accounted for about 8 percent of industry sales and 14 percent of employees in 1982. U.S. subsidiaries include ESE Ltd. and ITT Communications (subscriber apparatus), Motorola and Rockwell International Canada (mobile radio), Andrew Antenna, Farinon, MA Electronics, Raytheon and Varian (terrestrial and satellite transmission), Jerrold, and Central Dynamics (broadcasting) and Litton Systems.

In the 4 years since the Government's decision to permit customer purchase of phone apparatus, new firms have captured 15 percent of the market that traditionally belonged to the phone companies. The most successful domestic firms are Bell Communications Systems, Inc., Canadian Telecommunications Group (CTG), and Telecommunications Terminal Systems.

Exports have great significance to Canadian manufacturers (see table 3). The seven principal suppliers grew at an average annual rate of 20 percent between 1978 and 1982 primarily as a result of foreign sales. Small and medium-sized businesses export limited



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*Table 3.—Canada: Exports of telecommunications equipment by country, 1981-84*
(in millions of U.S. dollars)

| | 1981 | 1982 | 1983 | 1984 |
|---|---|---|---|---|
| Telephone apparatus equipment and parts | | | | |
| United States | 179.6 | 188.3 | 251.0 | 345.1 |
| Turkey | 15.8 | 31.1 | 48.1 | 68.5 |
| Ireland | 29.4 | 36.9 | 26.7 | 19.5 |
| United Kingdom | 12.7 | 10.0 | 22.7 | 36.2 |
| Korea | 7.8 | 36.6 | 21.9 | 5.5 |
| Other | 49.4 | 74.8 | 112.1 | 98.9 |
| Total | 294.7 | 377.7 | 482.5 | 573.7 |
| Telegraph apparatus equipment and parts | | | | |
| United States | 1.1 | 2.2 | .4 | |
| United Kingdom | .1 | 2.2 | 2.5 | 5.8 |
| Other | 2.4 | 2.7 | .6 | 1.4 |
| Total | 3.6 | 7.1 | 3.5 | 7.5 |
| Radio/TV broadcast transmission equipment | | | | |
| United States | 13.5 | 13.2 | 12.0 | 8.6 |
| United Kingdom | 2.6 | 2.8 | 1.7 | 1.3 |
| Other | 4.8 | 3.7 | 3.7 | 3.8 |
| Total | 20.9 | 19.7 | 17.4 | 13.7 |
| Commercial telecommunication equipment | | | | |
| United States | 179.6 | 143.2 | 113.3 | 148.9 |
| United Kingdom | 6.6 | 9.5 | 7.6 | 8.1 |
| Germany | 4.3 | 3.3 | 4.9 | 6.3 |
| Italy | 3.7 | 2.1 | 4.8 | 6.3 |
| Australia | 4.9 | 4.0 | 3.2 | 1.9 |
| Other | 83.0 | 91.3 | 46.8 | 67.4 |
| Total | 282.1 | 253.4 | 180.6 | 238.9 |
| Insulated wire and cable | | | | |
| United States | 50.5 | 44.3 | 67.9 | 86.2 |
| Saudi Arabia | 17.8 | 20.0 | 8.4 | 3.6 |
| Trinidad/Tobago | 2.3 | .9 | 4.9 | 5.6 |
| Puerto Rico | .2 | .4 | 2.0 | 5.4 |
| Other | 19.5 | 18.2 | 11.0 | 24.0 |
| Total | 90.3 | 83.8 | 94.2 | 124.8 |

Sources: Statistics Canada; International Trade Administration research report.

*Table 4.—Canada: Imports of telecommunications equipment by country, 1981-84*
(in millions of U.S. dollars)

| | 1981 | 1982 | 1983 | 1984 |
|---|---|---|---|---|
| Telephone apparatus equipment and parts | | | | |
| United States | 98.7 | 86.2 | 85.1 | 125.5 |
| Hong Kong | 1.2 | 3.2 | 12.9 | 7.3 |
| Japan | 7.0 | 4.5 | 12.0 | 22.5 |
| Korea | 3.2 | 5.2 | 10.2 | 7.6 |
| Taiwan | 1.4 | 2.4 | 8.3 | 6.5 |
| Other | 11.5 | 8.4 | 7.2 | 8.4 |
| Total | 123.0 | 109.9 | 135.7 | 177.8 |
| Telegraph apparatus equipment and parts | | | | |
| United States | 16.3 | 19.9 | 18.9 | 18.5 |
| Japan | 1.7 | 2.7 | 2.8 | 5.6 |
| Other | 1.2 | .8 | 1.4 | 1.8 |
| Total | 19.2 | 23.4 | 23.1 | 25.9 |
| Radio/TV broadcast transmission equipment | | | | |
| United States | 20.6 | 18.0 | 21.3 | 21.6 |
| Japan | 4.1 | 4.3 | 5.4 | 8.7 |
| France | .4 | .8 | 1.5 | 2.2 |
| Other | 3.4 | 1.7 | .5 | 2.0 |
| Total | 28.5 | 24.8 | 28.7 | 34.5 |
| Commercial communications equipment | | | | |
| United States | 91.2 | 94.9 | 138.2 | 215.0 |
| Japan | 32.6 | 30.8 | 39.2 | 22.5 |
| United Kingdom | 3.1 | 1.9 | 5.0 | 3.4 |
| Taiwan | 4.3 | 2.3 | 2.4 | 6.9 |
| Philippines | .7 | 1.0 | 1.7 | — |
| Other | 3.8 | 3.6 | 11.6 | 33.2 |
| Total | 135.7 | 134.5 | 198.1 | 281.0 |
| Telephone cable | | | | |
| United States | .8 | .6 | .5 | .4 |
| Other | .1 | .1 | .1 | — |
| Total | .9 | .7 | .6 | .4 |
| Telephone, radio, and TV wires | | | | |
| United States | 22.1 | 15.5 | 16.2 | 18.2 |
| Other | .4 | .7 | .3 | .9 |
| Total | 22.5 | 16.2 | 16.5 | 19.1 |
| Insulated wire and cable | | | | |
| United States | 53.5 | 48.9 | 52.5 | 58.5 |
| Norway | .2 | 23.2 | 56.6 | 24.2 |
| Germany | — | 35.0 | 20.3 | .1 |
| Other | 1.4 | .7 | 2.0 | 42.1 |
| Total | 55.1 | 107.8 | 131.4 | 124.9 |
| Electronic computers and parts (incl. datacom equipment) | | | | |
| United States | 1,838.9 | 2,006.4 | 2,126.7 | 2,801.7 |
| Japan | 20.5 | 36.1 | 88.6 | 72.1 |
| United Kingdom | 14.1 | 10.9 | 13.7 | 18.1 |
| Taiwan | .2 | 3.3 | 12.1 | 26.3 |
| Germany | 3.0 | 5.3 | 11.6 | 13.4 |
| Other | 64.2 | 83.2 | 86.5 | 132.4 |
| Total | 1,940.9 | 2,145.2 | 2,339.2 | 3,064.0 |

Sources: Statistics Canada; International Trade Administration research report.

product lines, generally of sophisticated equipment that is sold primarily to the deregulated U.S. market.

The U.S. share of imports has grown from 72 percent in 1980 to almost 90 percent in 1983 (see table 4). American firms dominate the radio-television broadcasting sector, in which 90 percent of broadcasting equipment and 30 percent of cable television equipment are imported. The Rolm Corporation is the most successful U.S. entry in the interconnect business.

The United Kingdom and Japan are the only other countries with significant presence in the market, although European companies such as Siemens (Germany) and Ericsson (Sweden) are active along with TIE Communications and Nippon Electronics in the telephone apparatus sector.

Foreign firms entering the equipment market must be prepared to function in a highly competitive situation and to develop the means, including effective distribution systems, to overcome the long-standing



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domestic preference of telecommunications carriers. U.S. firms have demonstrated that this can be done in newly deregulated portions of the market.

## End Users

The Canadian telecommunications industry involves a mixture of private, governmental, and joint public-private operating entities, regulated by Federal, provincial, and local regulatory agencies, and supported by a tradition of governmental planning. Two carrier groups, Telecom Canada and CNCP Telecommunications, account for about 93 percent of the $6 billion telecommunications carriage market and ensure quality service on a nationwide basis (see National Telecommunications Network and figure 2).

*National Telecommunications Network*
*(All figures presented in US$ or in units)*

| | 1982 | 1983 |
|---|---|---|
| Number of telephones | | |
| Residential | 11,758,000 | 11,745,000 |
| Business | 5,044,000 | 4,885,000 |
| Main stations | | |
| Individual lines | 9,128,000 | 9,315,000 |
| Two-party lines | 415,000 | 390,000 |
| Four-party lines | 377,000 | 431,000 |
| More than four lines | 215,000 | 209,000 |
| Wide area telephone service | 140,000 | 133,000 |
| Total | 10,150,000 | 10,362,000 |
| Number of key systems | 518,000 | 542,000 |
| Number of PBX's | 1,665,000 | 1,557,000 |
| Main line (Kilometers) | | |
| Exchange lines | 183,817,000 | 186,830,000 |
| Toll lines | 3,249,000 | 3,184,000 |
| Total | 187,066,000 | 190,014,000 |
| Number of exchanges (with population of 25,000+) | 143 | 139 |
| Number of telephones connected to: | | |
| Manual central offices | | |
| Magneto | 51 | 42 |
| Central | 324 | 291 |
| Automatic central offices | | |
| Step-by-step | 6,615,415 | 6,014,009 |
| Crossbar | 5,153,434 | 5,183,734 |
| Electronic switching | 4,708,673 | 5,298,184 |
| Other | 324,530 | 134,318 |
| Kilometers of cables (toll and exchange) | | |
| Single aerial wire | 163,039 | 200,623 |
| Wire in cable | | |
| Aerial | 54,870,386 | 55,208,397 |
| Buried (without conduits) | 38,494,512 | 39,410,402 |
| Underground (with conduits) | 93,178,258 | 94,888,677 |
| Submarine | 336,534 | 307,173 |
| Microwave radio relay systems | | |
| Route kilometers | 114,611 | 117,361 |
| Channel kilometers | 634,534 | 670,830 |
| Number of telephone calls | | |
| Local | 27,554,131,387 | 28,943,874,417 |
| Toll | 1,475,376,099 | 1,541,277,210 |
| International | 110,638,413 | 125,731,909 |
| Teletypewriters | | |
| On private lines | 6,685 | 6,170 |
| Connected to exchanges | 6,664 | 5,673 |
| Other | 1,492 | 1,442 |
| Number of mobile telephones | 50,000 | 52,000 |
| Telecommunications and telephone agencies: | | |
| Telephone | | |
| Total employees | 110,440 | 105,354 |
| Production employees | 61,118 | 61,041 |
| Total revenues ($US millions) | 6,372.9 | 6,924.3 |
| Telecommunication carriers | | |
| Total employees | 6,027 | NA |
| Total revenues ($US millions) | 434.6 | NA |
| Value of capital equipment of telephone systems | | |
| In place ($US millions) | | 11,220.6 |
| New investment | | 1,453.7 |

Sources: Statistics Canada; International Trade Administration research report.

CNCP, a joint effort of the Canadian National and Canadian Pacific Railways, exercises a monopoly in public voice message services and since 1979 has provided privately leased long-distance voice and data lines to business in competition with major telephone companies. Telecom Canada is a consortium of the nine major phone companies and Telesat, ensuring generally uniform standards across the country and coordinating long-distance service.

The principal telephone companies are Bell Canada, providing about half of total telecommunications services in revenue terms; British Columbia Telephone Company (B.C. Tel), majority-owned by a subsidiary of GTE (United States); and Alberta Government Telephones (AGT), a provincial Crown corporation. B. C. Tel and AGT together account for another third of total operating revenues. The Federal Government owns two telephone companies through Canadian National Telecommunications—Northwest Tel and Terra Nova Tel—providing service to the Yukon, Northwest Territories, and Newfoundland. Other operators include the provincially owned companies in Manitoba and Saskatchewan, municipally owned utilities in Edmonton (Alberta) and Thunder Bay (Ontario), and other private companies with ownership participation by Bell Canada or GTE. Bell Canada and Northern Telecom are both subsidiaries of Bell Enterprises. B.C. Tel is supplied by its own subsidiary, Microtel, and AGT is supplied by provincially owned Novatel.

Telesat is 50 percent owned by the Federal Government and 50 percent by the phone companies. Teleglobe Canada, a Federal Crown corporation, offers a wide range of international services via cable and satellite. The current national administration has proposed selling the highly profitable Teleglobe to private industry. The potential sale raises issues of continued monopoly versus competition and the



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possible place of foreign entities in any purchase scheme.

The national Canadian Broadcasting Company dominates radio and television broadcasting. Commercial stations, regional television networks, Global Communications Limited, and the CTV national networks comprise the private sector, with the Canadian cable television industry providing the largest CATV network in the industrialized world. In 1981, 326 companies were operating over 600 systems, and 74 percent of Canadian homes subscribed.

Other end users of telecommunications hardware include banks, natural resource firms, health care institutions, military and aerospace entities, and manufacturing and business organizations. In 1984, the country's first private satellite network was installed by Telecom Canada for Imperial Oil Ltd., and the Bank of Montreal was the first to lease a private international satellite link from Teleglobe.

Projects planned or underway by principal users include:

- Investment of $2.6 million by Northwest Tel to add five more communities to its Spacetel system in the Northwest Territories
- Major fiber optics projects by the Manitoba and Saskatchewan phone system
- Bell Canada's program to use fiber optics in all new installations and to replace copper cable with fiber in central office trunks

The Federal regulatory authority, Canadian Radio-Television and Telecommunications Commission, has jurisdiction over broadcasting and cable television, CNCP, Telesat, and, among telepone systems, Bell Canada, B. C. Tel, and Canadian National. Provincial or local utility boards regulate the other phone companies; some of the boards have resisted deregulation, refusing to approve interconnect of customer-owned equipment or, in the case of Alberta, refusing to allow CNCP to interconnect privately leased lines with the public network.

## Marketing Practices

Distributors represent a key factor in marketing telecommunications products and providing support services, even for the major domestic suppliers. In the telephone market, Northern Telecom sells wholly through distributors such as Telecommunications Terminal Systems, and Mitel uses a wholesale distributor which then sells to interconnect firms that market to the customer. Rolm established its own subsidiary to act as distributor. Firms attempting to rely on direct sales forces have encountered difficulty. In broadcasting, some companies have used direct selling approaches, but the general emphasis is on a well-developed distribution network. Mobile radio and data communications equipment are also available through distributors; IBM uses its own sales force for large accounts and distributors to reach smaller accounts. Financing of equipment purchases is entirely between purchaser and vendor; no international lending agencies are involved.

**Figure 2**
**Canada: Cities With Largest Number of Main Phones, 1983**

Country Total: 2,667,737
Source: AT&T Communications, *The World's Telephones (1983).*

The government tender process is open, and decisions are made on the basis of competitive bidding. For contracts not covered by the GATT Government Procurement Agreement, the Government grants up to a 10-percent credit to Canadian-owned companies engaged in the bidding. Foreign firms wishing to market equipment to the Federal Government should contact both the Government Telecommunications Agency of the Department of Commerce, which originates all requests for equipment purchases, and Supply and Services Canada, the procurement agency. A company must apply to the corporate affairs section of Supply and Services to be considered for listing as a possible supplier. Evaluation is made on the basis of the firm's past performance and financial strength.

Recent trade shows include the biennial International Electrical/Electronics Conference and Exposition, the CCBE Broadcast Equipment Trade Show, and Radiocom. Several computer and office automation



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shows are held annually throughout Canada, sponsored by Industrial Trade Shows of Toronto.

The Government does not impose import restrictions on foreign products; any item compatible with the Canadian national network is permitted. In fact, foreign suppliers benefit from certification costs applied only to domestically produced telephone equipment.

Preferential tariff rates are given to Commonwealth countries (except for England as a member of EEC) and most Third World countries. The United States has "most favored nation" status along with other industrialized countries, paying from 3.9 percent tariff for data communications equipment to 17.5 percent for telephone apparatus, with an average rate of 11 percent.

*Principal Canadian Telephone Systems and Telecommunication Charges*

| Carrier | Service Area | Regulator | Ownership | Telecom Member |
|---|---|---|---|---|
| **Telephone systems** | | | | |
| Alberta Government Telephones | Province of Alberta except City of Edmonton | Public Utility Board | Provincial Crown Corporation | Yes |
| Bell Canada | Major portions of the provinces of Quebec and Ontario and sections of the Northwest Territories | Canadian Radio-television and Telecommunications Commission | Investor-owned utility | Yes |
| British Columbia Telephone Company | Province of British Columbia | Canadian Radio-television and Telecommunications Commission | Investor-owned utility. Majority of common shares owned by Anglo-Canadian Telephone, a subsidiary of GTE (U.S.) | Yes |
| Edmonton Telephones | City of Edmonton, Alberta | City Council | Municipally-owned utility | No |
| The Island Telephone Company Limited | Prince Edward Island | Public Utility Commission of Prince Edward Island | Equity control owned by Maritime Telephone and Telegraph (Halifax) | Yes |
| Manitoba Telephone System | Province of Manitoba | Public Utility Board | Provincial Crown Corporation | Yes |
| Maritime Telegraphy and Telephone Company Limited | Province of Nova Scotia | Nova Scotia Public Utility Board | Investor-owned utility. About 39% of the common shares are registered under the name of Bell Canada | Yes |
| New Brunswick Telephone Company Limited | Province of New Brunswick | New Brunswick Board of Commissioners of Public Utilities | Investor-owned utility. About 40% of the outstanding common shares is owned by Bell Canada | Yes |
| Newfoundland Telephone Company Limited | Eastern and Southern Newfoundland | Board of Commissioners of Public Utilities | Investor-owned utility. Bell Canada owns 66% of the outstanding common shares | Yes |
| Northern Telephone Limited | Northeastern Ontario | Ontario Telephone Commission | Bell Canada owns 99.8% of the outstanding common shares | No |
| Okanagan Telephone Company | Okanagan Valley of British Columbia | | At the time of the survey, British Columbia Telephone Company (BC Tel) owned 99.2% of the shares of this company. Okanagan Telephone Company is now an operating subsidiary of BC Tel. | No |
| Quebec Telephone | Gaspe Peninsula and Quebec North Shore | Public Service Board of the Province of Quebec | Investor-owned utility. A majority of the outstanding common shares is owned by Anglo-Canadian Telephone, a subsidiary of GTE (U.S.) | No |
| Saskatchewan Telecommunications | Saskatchewan | Public Utility Board | Provincial Crown Corporation | Yes |
| **Telecommunications carriers** | | | | |
| Canadian National Telecommunications | Telephone operations in the Yukon, Northwest Territories and Newfoundland provided through subsidiaries Northwest Telecommunications and Terra Nova Telecommunications. Other services provided through the Canada-wide CNCP consortium | Canadian Radio-television and Telecommunications Commission | Federal Crown Corporation | No |



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*Principal Canadian Telephone Systems and Telecommunication Charges*

| Carrier | Service Area | Regulator | Ownership | Telecom Member |
|---|---|---|---|---|
| Canadian Pacific Telecommunications | Provides telecommunications services other than telephone through the CNCP consortium | Canadian Radio-television and Telecommunications Commission | Subsidiary of Canadian Pacific Ltd. | No |
| Ontario Northland Communications | Northern Ontario | Ontario Telephone Commission | Provincial agency | No |
| Telegobe Canada | International Service | Not regulated federally | Federal Crown Corporation | No |
| Telesat | Canada | Canadian Radio-Television and Telecommunications Commission | 50% Federal Government 50% Telephone Companies | Yes |

## Leading Suppliers

| Company | Country | Products |
|---|---|---|
| **Telephone/telex equipment** | | |
| **Domestic** | | |
| Microtel | | Analog and digital electronic switching systems, microwave radio, analog and digital multiplex, entry control, digital PBX, satellite earth stations |
| Mitel Corporation | | Telephone attachments and equipment, PBX equipment, terminal products, semiconductors |
| Northern Telecom Ltd. | | Telephone transmission, office switching, and test equipment, cable, connectors, fiber optics, transmission systems, electronic office equipment |
| **Transmission** | | |
| Canada Wire & Cable | | Wire and insulated electrical wires, cables, and fiber optics systems |
| **Mobile radio** | | |
| Novatel | | Cellular radio communication systems |
| **Video/audio broadcast equipment** | | |
| Central Dynamics Ltd. | | Studio equipment |
| Electrohome Ltd. | | "Electrohome" video display products, fractional h.p. motors, commercial contract video monitors, specialized electronic products, telidon/videotex terminals, printed single and double sided circuit boards, earth/satellite receivers and amplifiers |
| McCurdy Radio Industries, Ltd. | | McCurdy broadcast equipment video distribution and switching equipment, computer assisted automation for broadcast applications |
| Viewstar Inc. | | CATV converters, satellite receivers |
| **Data communications equipment** | | |
| Develcon Electronics Ltd. | | Data processing, assistance network extender and repeater, intelligent, electronic, data-line switching machines |
| Gandalf Technologies Ltd. | | PACX, moderns, multiplexers, module data transmission equipment, intelligent network equipment, limited distance sets |
| Interdaco—International Data Control Corp. | | Communications multi-channel telegraph and data transmission equipment, both frequency and time division multiplex |
| **Telephone/telex equipment** | | |
| **Foreign** | | |
| Plessey Canada Ltd. | U.K. | "TIE" telephone subscriber apparatus |
| Rolm Canada | U.S.A. | Telephone, PBX equipment |
| Siemens Electronic Ltd. | Gennany | Design, manufacturing, marketing, and servicing of electrical and electronics products and systems for utilities, industry, medicine and science |
| **Transmission** | | |
| Delta Benco Cascade Ltd. | U.K. | Transmission equipment for cable TV |
| Phillips Cable Ltd. | U.K. | Hot rolled copper rod, electric and communication cables of all descriptions |
| Pirelli Cables Inc. | U.K. | Electric wire and cable, telephone cable, office plant communications products |
| Raytheon Canada Ltd. | U.S.A. | ATC surveillance radar and navaids, satellite earth stations, and microwave radio relay equipment |
| **Mobile radio** | | |
| Canadian General Co. Ltd. | U.S.A. | Mobile radio and telephone equipment |



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## Leading Suppliers—continued

| Company | Country | Products |
|---|---|---|
| Motorola Canada Ltd. | U.S.A. | Mobile and portable radio, car telephones, paging, alarm systems |
| **Video/audio broadcast equipment** | | |
| Andrew Antenna | U.S.A. | Communications microwave and earth station antennas, radio frequency, transmission lines, microwave broadcast towers |
| Central Dynamics Ltd. | U.S.A. | Video broadcast and switching equipment |
| Digital Video Systems | U.S.A. | Television and audio encryption products including assembly, time base connectors, frame stores, synchronizers |
| Jerrold Division, General Instrument | U.S.A. | CATV equipment and systems engineering, set top converters, pay TV products, home security systems |
| **Data communications equipment** | | |
| Control Data Canada Ltd. | U.S.A. | Computer systems and products |
| Digital Equipment Canada Ltd. | U.S.A. | Peripheral computer equipment, computers (micro to mainframe) |
| IBM Canada Ltd. | U.S.A. | Data processing systems/office products |

## Useful Addresses

### Embassies

American Embassy
Commercial Section
100 Wellington St.
Ottawa K1P 5T1
tf: 238 53 35
tx: 0533582

### Embassy of Canada

1746 Massachusetts Avenue, N.W.
Washington, DC 20036
tf: 785-1400

### Telecommunications administration

Department of Communications
International Relations Branch
Journal North Building
300 Slater Street
Ottawa, Ontario K1A 0C8
Attn: Director
tf: 995 98 10
tg: comtel ottawa
tx: CNP 0535342 comtel ott

### PTT

Telecom Canada (formerly "Transcanada Telephone System—TCTS")
410 Laurier Avenue West
Ottawa, Ontario K1P 6H5
Attn: Secretary
tf: 560 32 30
tx: TWX 6105628923 tcts hq

Canadian National and Canadian Pacific Telecommunications (CNCP)
3300 Bloor Street, West
Toronto, Ontario M8X 2W9
Attn: President and Chief Executive Officer
tf: 232 60 50
tx: CNP 6218362 cncp pcng tor

Teleglobe Canada
680 West Sherbrooke Street
Montreal, Quebec H3A 2S4
Attn: Director General, Public Relations
tf: 281 52 12
tg: teleglobe montreal
tx: CNP 525780 ca525780 mtl

### Leased lines and data communications

CNCP
3300 Bloor Street, West
Public Affairs
Toronto, Ontario M8X 2W9
tf: 232 63 65
tx: CNP 6218362 cncp pcng tor

### Radio/Television broadcasting

Canadian Broadcasting Corporation
CBC Building
1500 Bronsen Avenue
P.O. Box 8478
Ottawa, Ontario K1G 3J5
Attn: President and Chairman of the Board of Directors
tf: 731 31 11
tg: broadcast ottawa
tx: 053 4260 cbc ott

### Technical standards

Standards Council of Canada (SCC)
Standards Information Service
350 Sparks Street
Suite 610
Ottawa
Ontario K1R 7S8
tf: 238 32 22
tx: 0534403 stancan ott



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## Canada: Basic Economic Indicators

| | | | |
|---|---|---|---|
| Population: | 25.2 million (1984) | Major trading partners: | United States, Japan, EC |
| Area: | 9,971,500 sq. km. | Exchange rate: | 1.226 C$ = US$1 (1983) |
| Administrative units: | 10 provinces and 2 territories | Fiscal year: | 1 April-31 March |
| GNP: | $323.2 billion (1984) | Current account balance: | +$2,470 million (1982) |
| Contributions to GNP: | Services 67% (1982) | International reserves: | $12,258 million (1982) |
| | Industry 16% | Federal budget | |
| | Agriculture 4% | revenues: | $52,406 million (1981) |
| Per capita income: | $13,000 (1984) | expenditures: | $58,971 million |
| Inflation f.o.b: | 9.3% (1982) | Labor force: | 11.0 million (1984) |
| Exports f.o.b.: | $73.8 billion (1983) | Unemployment: | 11.3% (1984) |
| U.S. share: | 72% | Average daily wage: | $11.00 (1984) |
| Imports c.i.f. | $65.87 billion (1983) | | |
| U.S. share: | 69% | | |

## Additional Information

**The project officer responsible for Country Market Surveys on telecommunications equipment is:**

**Hayden M. Wetzel**
**ITA/EPS, Room H2012**
**International Trade Administration**
**U.S. Department of Commerce**
**Washington, DC 20230**
**Telephone: (202) 377-4493**

**Current information on marketing conditions in Canada is available from:**

**Canada Desk Officer**
**ITA/IEP, Room H3027**
**U.S. Department of Commerce**
**Washington, DC 20230**
**Telephone: (202) 377-3101**

**Department-sponsored trade shows and other promotional vehicles for telecommunications equipment are handled by:**

**Theresa Rettig**
**ITA/TD, Room H1015B**
**U.S. Department of Commerce**
**Washington, DC 20230**
**Telephone: (202) 377-2952**

**For a free copy of the newest catalog of Market Research Division reports, which lists all Country Market Surveys and selected International Market Research reports, please write to:**

**International Market Research Services**
**ITA/EPS, Room H1324**
**U.S. Department of Commerce**
**Washington, DC 20044**
**Telephone: (202) 377-2665**



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# Available reports on Telecommunications Equipment Markets

### International Market Research
### (full research reports)

| | | | | | |
|---|---|---|---|---|---|
| IMR/TCE/602/83 | Australia (Feb 83) | $100 | IMR/TCE/557/85 | Malaysia (Jun 85) | $80 |
| IMR/TCE/423/85 | Belgium (Oct 85) | 100 | IMR/TCE/201/83 | Mexico (Feb 83) | 120 |
| IMR/TCE/122/85 | Canada (Jan 85) | 120 | IMR/TCE/421/82 | Netherlands (Nov 82) | 120 |
| IMR/TCE/570/84 | China (Jan 84) | 80 | IMR/TCE/565/84 | Philippines (May 84) | 120 |
| IMR/TCE/729/85 | Egypt (Jul 85) | 100 | IMR/TCE/517/84 | Saudi Arabia (Jul 84) | 120 |
| IMR/TCE/427/85 | France (Sep 85) | 120 | IMR/TCE/201/83 | Spain (Oct 83) | 120 |
| IMR/TCE/428/84 | Germany (Mar 84) | 120 | IMR/TCE/441/85 | Switzerland (Sep 85) | 100 |
| IMR/TCE/560/85 | Indonesia (Apr 85) | 100 | IMR/TCE/421/84 | Thailand (Feb 84) | 100 |
| IMR/TCE/505/83 | Iraq (Apr 83) | 100 | IMR/TCE/520/84 | U. A. E. (Apr 84) | 100 |
| IMR/TCE/508/85 | Israel (Feb 85) | 100 | IMR/TCE/412/85 | United Kingdom (Jan 85) | 100 |
| IMR/TCE/475/85 | Italy (Jun 85) | 100 | IMR/TCE/307/85 | Venezuela (Aug 85) | 100 |
| IMR/TCE/518/84 | Kuwait (Mar 84) | 100 | | | |

### Country Market Surveys
### (published summary reports — $10 each)

| | | | |
|---|---|---|---|
| CMS/TCE/721/82 | Algeria (Apr 82) | CMS/TCE/588/83 | Japan (Apr 83) |
| CMS/TCE/357/84 | Argentina (Feb 84) | CMS/TCE/580/81 | Korea (Sep 81) |
| CMS/TCE/602/83 | Australia (Aug 83) | CMS/TCE/518/85 | Kuwait (Apr 85) |
| CMS/TCE/351/82 | Brazil (Dec 82) | CMS/TCE/557/81 | Malaysia (Apr 81) |
| CMS/TCE/122/85 | Canada (Nov 85) | CMS/TCE/201/83 | Mexico (Jun 83) |
| CMS/TCE/337/83 | Chile (Aug 83) | CMS/TCE/421/83 | Netherlands (Jun 83) |
| CMS/TCE/570/85 | China (Apr 85) | CMS/TCE/753/82 | Nigeria (Dec 82) |
| CMS/TCE/301/85 | Colombia (Aug 85) | CMS/TCE/403/83 | Norway (May 83) |
| CMS/TCE/409/83 | Denmark (Nov 83) | CMS/TCE/535/85 | Pakistan (Jul 85) |
| CMS/TCE/729/81 | Egypt (Jul 81) | CMS/TCE/565/85 | Philippines (Apr 85) |
| CMS/TCE/427/85 | France (Jul 85) | CMS/TCE/517/81 | Saudi Arabia (Apr 85) |
| CMS/TCE/428/85 | Germany (Apr 85) | CMS/TCE/559/83 | Singapore (Feb 83) |
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| CMS/TCE/205/83 | Guatemala (May 83) | CMS/TCE/469/84 | Spain (Jul 84) |
| CMS/TCE/582/81 | Hong Kong (Jan 81) | CMS/TCE/401/82 | Sweden (Dec 82) |
| CMS/TCE/533/81 | India (Feb 81) | CMS/TCE/549/85 | Thailand (Apr 85) |
| CMS/TCE/560/83 | Indonesia (Apr 83) | CMS/TCE/489/81 | Turkey (Oct 81) |
| CMS/TCE/505/83 | Iraq (Sep 83) | CMS/TCE/520/85 | U. A. E. (Apr 85) |
| CMS/TCE/508/82 | Israel (Jun 82) | CMS/TCE/412/82 | United Kingdom (Dec 82) |
| CMS/TCE/475/83 | Italy (Jun 83) | CMS/TCE/307/81 | Venezuela (Feb 81) |
| CMS/TCE/748/81 | Ivory Coast (Apr 81) | CMS/TCE/796/82 | Zimbabwe (Dec 82) |

### International Marketing Information
### (U.S. embassy reports)

| | | | | | |
|---|---|---|---|---|---|
| IMI/TCE/721/84 | Algeria (Aug 84) | $15 | IMI/TCE/401/83 | Sweden (May 83) | $25 |
| IMI/TCE/301/84 | Colombia (Dec 84) | 60 | IMI/TCE/583/83 | Taiwan (Aug 83) | 25 |
| IMI/TCE/428/83 | Germany (May 83) | 25 | | | |

### Reference Guides
### (address and contact lists)

| | | | | | |
|---|---|---|---|---|---|
| IMI/TCE/XX1/85 | Telecom Administrators and Operators Worldwide (Feb 85) | $25 | IMI/TCE/XX3/85 | Telecom Satellite Users and Research Organizations Worldwide (Feb 85) | $20 |
| IMI/TCE/XX2/85 | Frequency Allocation Offices Worldwide (Feb 85) | 15 | IMI/XXX/XX1/85 | Standards Organizations Worldwide (Feb 85) | 20 |



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